

## **ABSTRACT**

The present invention relates to apparatus and method for high throughput determining and/or monitoring electrophysiological and fluorescence properties of ion channels or ion channel-containing structures, such as cell membranes, by establishing an  
5 configuration in which a cell membrane forms a highly resistive seal around an orifice, making it possible to determine and monitor a current flow through the cell membrane. The substrate can be part of an apparatus for simultaneously studying cell membranes using electrical and fluorescent techniques. The apparatus is formed of all transparent materials and preferably part of a multi-well plate.